



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/107,371	06/30/98	HAUCK	J 1270

BECK & TYSVER  
SUITE 440  
1011 FIRST STREET SOUTH  
HOPKINS MN 55343

QM12/0929

EXAMINER

RUDDY, D

ART UNIT

PAPER NUMBER

3739

DATE MAILED: 09/29/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/107,371

Applicant(s)

Hauck et al.

Examiner

David Ruddy

Group Art Unit

3739



☒ Responsive to communication(s) filed on Jun 30, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-7 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-7 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 3739

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Geiser et al (patent #5,360,006). Geiser et al. disclose a method of collecting points, having coordinates in space, inside the heart and computing the convex hull shape which estimates the boundary of the heart from the set of points. As explained in column 10, line 62 - column 11, line 25 and column 17, line 5-10, the method further comprises resampling the shape and smoothing (column 10, lines 35-51, and column 11, lines 34-41) the hull shape and approximating the shape of the heart chamber. As explained in column 1, lines 45-54; column 3, lines 60-66; and column 12, lines 51-67, the points are collected and noted at a specific time during the cardiac cycle. Accordingly, from this data, determinations can be made of hull shape at different portions of the cardiac cycle, heart wall position (ie. epicardial and endocardial boundaries) and cardiac wall velocity (column 14, lines 40-57).

Art Unit: 3739

3. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Geiser et al (patent #5,797,396). Geiser et al. disclose a method of collecting points, having coordinates in space, inside the heart and computing the convex hull shape which estimates the boundary of the heart from the set of points. The method further comprises resampling (column 24, lines 10-28) the shape and smoothing (as represented by the discussion of multiple filters throughout the reference) the hull shape and approximating the shape of the heart chamber. The points are collected and noted at a specific time during the cardiac cycle. Accordingly, from this data, determinations can be made of hull shape at different portions of the cardiac cycle, heart wall position (ie. epicardial and endocardial boundaries) and cardiac wall velocity (column 25, line 30 - column 26, line 25).

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by Ben-Haim. As explained in column 18, lines 1-48 and column 22, lines 10-13, Ben-Haim expressly discloses the method of claim 1.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3739

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Geiser et al (patent #5,360,006). With reference to the above rejections Geiser et al. disclose all that is claimed except an expressly disclosed step of measuring cardiac wall acceleration. With reference to column 14, lines 54-57, the wall velocity is determined based upon the first derivative of position (ie. the change in position with respect to time). Accordingly, one having ordinary skill in Newtonian physics would realize that the determination of acceleration can be made by taking the second derivative of position (ie. an acceleration determination can be made by measuring change in velocity with respect to time). The determination of acceleration is advantageous in that various cardiovascular parameters (such as blood flow and force of ejection) can be determined based on its measurement. Accordingly, it would have been obvious to one having ordinary skill in the art to determine the heart wall acceleration.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Geiser et al (patent #5,797,396). With reference to the above rejections Geiser et al. disclose all that is claimed except an expressly disclosed step of measuring cardiac wall acceleration. With reference to column 25, line 30 -column 26, line 25, the wall velocity is determined based upon the first derivative of position (ie. the change in position with respect to time). Accordingly, one having ordinary skill in Newtonian physics would realize that the determination of acceleration can be

Art Unit: 3739


made by taking the second derivative of position (ie. an acceleration determination can be made by measuring change in velocity with respect to time). The determination of acceleration is advantageous in that various cardiovascular parameters (such as blood flow and force of ejection) can be determined based on its measurement. Accordingly, it would have been obvious to one having ordinary skill in the art to determine the heart wall acceleration.

*Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references of Cline et al. and Curwen et al. disclose similar methods of modeling a chamber of the heart.

Any inquiry concerning this communication should be directed to examiner David Ruddy at telephone number (703) 308-3595. The fax number for this group is (703) 308-0758.

DR



LINDA C. M. DVORAK  
SUPERVISORY PATENT EXAMINER  
GROUP 3700